General

Guideline Title

Fractures (non-complex): assessment and management.

Bibliographic Source(s)

National Clinical Guideline Centre. Fractures (non-complex): assessment and management. London (UK): National Institute for Health and Care Excellence (NICE); 2016 Feb 17. 17 p. (NICE guideline; no. 38).

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

August 31, 2016 – Opioid pain and cough medicines combined with benzodiazepines : A U.S. Food and Drug Administration (FDA) review has found that the growing combined used of opioid medicines with benzodiazepines or other drugs that depress the central nervous system (CNS) has resulted in serious side effects, including slowed or difficult breathing and deaths. FDA is adding Boxed Warnings to the drug labeling of prescription opioid pain and prescription opioid cough medicines and benzodiazepines.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and

related appendices.

The wording used in the recommendations in this guideline (for example, words such as 'offer' and 'consider') denotes the certainty with which the recommendation is made (the strength of the recommendation) and is defined at the end of the "Major Recommendations" field.

NICE has developed four related clinical guidelines and one service delivery guideline related to the management of people with traumatic injuries including this guideline on non-complex fractures and the following guidelines.

- Fractures (complex): assessment and management
- Major trauma: assessment and initial management
- Major trauma: service delivery
- Spinal injury: assessment and initial management

Recommendations below apply to both children (under 16s) and adults (16 or over) unless otherwise specified. Some recommendations on management depend on whether the growth plate of the injured bone has closed (skeletal maturity). The age at which this happens varies. In practice, healthcare professionals use clinical judgement to determine skeletal maturity. When a recommendation depends on skeletal maturity this is clearly indicated.

Initial Pain Management and Immobilisation

Pain Assessment

See the NICE guideline on patient experience in adult NHS services for advice on assessing pain in adults.

Assess pain regularly in people with fractures using a pain assessment scale suitable for the person's age, developmental stage and cognitive function.

Continue to assess pain in hospital using the same pain assessment scale that was used in the pre-hospital setting.

Initial Pharmacological Management of Pain in Adults (16 or Over)

For the initial management of pain in adults (16 or over) with suspected long bone fractures of the legs (tibia, fibula) or arms (humerus, radius, ulna), offer:

- Oral paracetamol for mild pain
- Oral paracetamol and codeine for moderate pain
- Intravenous paracetamol supplemented with intravenous morphine titrated to effect for severe pain

Use intravenous opioids with caution in frail or older adults.

Do not offer non-steroidal anti-inflammatory drugs (NSAIDs) to frail or older adults with fractures.

Consider NSAIDs to supplement the pain relief in recommendation above except for frail or older adults.

Initial Pharmacological Management of Pain in Children (Under 16s)

For the initial management of pain in children (under 16s) with suspected long bone fractures of the legs (femur, tibia, fibula) or arms (humerus, radius, ulna), offer:

- Oral ibuprofen, or oral paracetamol, or both for mild to moderate pain
- Intranasal or intravenous opioids for moderate to severe pain (use intravenous opioids if intravenous access has been established)

Hot Reporting

A radiologist, radiographer or other trained reporter should deliver the definitive written report of emergency department X-rays of suspected fractures before the patient is discharged from the emergency

department.

Splinting Long Bone Fractures of the Leg in the Pre-hospital Setting

In the pre-hospital setting, consider the following for people with suspected long bone fractures of the legs:

- A traction splint or adjacent leg as a splint if the suspected fracture is above the knee
- A vacuum splint for all other suspected long bone fractures

Femoral Nerve Blocks in Children (Under 16s)

Consider a femoral nerve block or fascia iliaca block in the emergency department for children (under 16s) with suspected displaced femoral fractures.

Acute Stage Assessment and Diagnostic Imaging

Use of Clinical Prediction Rules for Suspected Knee Fractures

Use the Ottawa knee rules to determine whether an X-ray is needed in people over 2 years with suspected knee fractures.

Use of Clinical Prediction Rules for Suspected Ankle Fractures

Use the Ottawa ankle and foot rules to determine whether an X-ray is needed in people over 5 years with suspected ankle fractures.

Imaging of Scaphoid Fractures

Consider magnetic resonance imaging (MRI) for first-line imaging in people with suspected scaphoid fractures following a thorough clinical examination.

Management in the Emergency Department

Reduction of Distal Radius Fractures

Consider intravenous regional anaesthesia (Bier's block) when reducing dorsally displaced distal radius fractures in adults (16 or over) in the emergency department. This should be performed by healthcare professionals trained in the technique, not necessarily anaesthetists.

Do not use gas and air (nitrous oxide and oxygen) on its own when reducing dorsally displaced distal radius fractures in the emergency department.

Management of Torus Fractures

Do not use a rigid cast for torus fractures of the distal radius.

Discharge children with torus fractures after first assessment and advise parents and carers that further review is not usually needed.

Ongoing Orthopaedic Management

Non-Surgical Orthopaedic Management of Unimalleolar Ankle Fractures

In the non-surgical orthopaedic management of unimalleolar ankle fractures:

- Advise immediate unrestricted weight-bearing as tolerated
- Arrange for orthopaedic follow-up within 2 weeks if there is uncertainty about stability
- Advise all patients to return for review if symptoms are not improving 6 weeks after injury

Timing of Surgery for Ankle Fractures

If treating an ankle fracture with surgery, consider operating on the day of injury or the next day.

Timing of Surgery for Distal Radius Fractures

When needed for distal radius fractures, perform surgery:

- Within 72 hours of injury for intra-articular fractures
- Within 7 days of injury for extra-articular fractures

When needed for re-displacement of distal radius fractures, perform surgery within 72 hours of the decision to operate.

Definitive Treatment of Distal Radius Fractures in Adults (Skeletally Mature)

Consider manipulation and a plaster cast in adults (skeletally mature) with dorsally displaced distal radius fractures.

When surgical fixation is needed for dorsally displaced distal radius fractures in adults (skeletally mature):

- Offer K-wire fixation if:
  - No fracture of the articular surface of the radial carpal joint is detected, or
  - Displacement of the radial carpal joint can be reduced by closed manipulation
- Consider open reduction and internal fixation if closed reduction of the radial carpal joint surface is not possible.

Definitive Treatment of Distal Radius Fractures in Children (Skeletally Immature)

In children (skeletally immature) with dorsally displaced distal radius fractures (including fractures involving a growth plate) who have undergone manipulation, consider:

- A below-elbow plaster cast, or
- K-wire fixation if the fracture is completely displaced (off-ended)

Definitive Treatment of Proximal Humerus Fractures in Adults (Skeletally Mature)

For adults (skeletally mature) with displaced low energy proximal humerus fractures:

- Offer non-surgical management for definitive treatment of uncomplicated injuries
- Consider surgery for injuries complicated by an open wound, tenting of the skin, vascular injury, fracture dislocation or a split of the humeral head

Definitive Treatment of Femoral Shaft Fractures in Children (Skeletally Immature)

Admit all children (skeletally immature) with femoral shaft fractures and consider 1 of the following according to age and weight:

- Prematurity and birth injuries: simple padded splint
- 0 to 6 months: Pavlik's harness or Gallows traction
- 3 to 18 months (but not in children over 15 kg): Gallows traction
- 1 to 6 years: straight leg skin traction (becomes impractical in children over 25 kg) with possible conversion to hip spica cast to enable early discharge
- 4 to 12 years (but not in children over 50 kg): elastic intramedullary nail
- 11 years to skeletal maturity (weight more than 50 kg): elastic intramedullary nails supplemented by end-caps, lateral-entry antegrade rigid intramedullary nail, or submuscular plating

Mobilisation after Surgery in People with Distal Femoral Fractures

Consider advising immediate unrestricted weight-bearing as tolerated for people who have had surgery for distal femoral fractures.

Documentation

The NGC summary of the NICE guideline Major trauma: service delivery contains recommendations for ambulance and hospital trust boards, senior managers and commissioners on documentation within a trauma network.

Consider developing and using standard documentation to prompt the assessment of the following from first presentation in people with fractures:

- Safeguarding
- Comorbidities
- Falls risk
- Nature of fracture, including classification where possible

Follow a structured process when handing over care within the emergency department (including shift changes) and to other departments. Ensure that the handover is documented.

Ensure that all patient documentation, including images and reports, goes with patients when they are transferred to other departments or centres.

Produce a written summary, which gives the diagnosis, management plan and expected outcome, and:

- Is aimed at and sent to the patient's general practitioner (GP) within 24 hours of admission
- Includes a summary written in plain English that is understandable by patients, family members and carers
- Is readily available in the patient's records

Information and Support for Patients, Family Members and Carers

The NGC summary of the NICE guideline Major trauma: service delivery contains a recommendation for ambulance and hospital trust boards, senior managers and commissioners on providing information and support to patients, family members and carers.

Providing Support

When communicating with patients, family members and carers:

- Manage expectations and avoid misinformation
- Answer questions and provide information honestly, within the limits of your knowledge
- Do not speculate and avoid being overly optimistic or pessimistic when discussing information on further investigations, diagnosis or prognosis
- Ask if there are any other questions

If possible, ask the patient if they want someone (family member, carer or friend) with them.

Reassure people while they are having procedures for fractures under local and regional anaesthesia.

Support for Children and Vulnerable Adults

Allocate a dedicated member of staff to contact the next of kin and provide support for unaccompanied children and vulnerable adults.

For a child or vulnerable adult with a fracture, enable their family members or carers to remain within eyesight if appropriate.

Work with family members and carers of children and vulnerable adults to provide information and support. Take into account the age, developmental stage and cognitive function of the child or vulnerable adult.

Include siblings of an injured child when offering support to family members and carers.

Providing Information

Explain to patients, family members and carers, what is happening and why it is happening. Provide:

- Information on known injuries
- Details of immediate investigations and treatment, and if possible include time schedules

Offer people with fractures the opportunity to see images of their injury taken before and after treatment.

Provide people with fractures with both verbal and written information on the following when the management plan is agreed or changed:

- Expected outcomes of treatment, including time to returning to usual activities and the likelihood of any permanent effects on quality of life (such as pain, loss of function or psychological effects)
- Activities they can do to help themselves
- Home care options, if needed
- Rehabilitation, including whom to contact and how (this should include information on the importance of active patient participation for achieving goals and the expectations of rehabilitation)
- Mobilisation and weight-bearing, including upper limb load-bearing for arm fractures

Document all key communications with patients, family members and carers about the management plan.

Ensure that all health and social care practitioners have access to information previously given to people with fractures to enable consistent information to be provided.

Providing Information about Transfer from the Emergency Department

For patients who are being transferred from an emergency department to another centre, provide verbal and written information that includes:

- The reason for the transfer
- The location of the receiving centre and the patient's destination within the receiving centre
- The name and contact details of the person responsible for the patient's care at the receiving centre
- The name and contact details of the person who was responsible for the patient's care at the initial hospital

Non-accidental Injury

Address issues of non-accidental injury before discharge in all children with femoral fractures. This is particularly important for children who are not walking or talking. For more information, see the NICE guideline on when to suspect child maltreatment .

Training and Skills

These recommendations are for ambulance and hospital trust boards, medical directors and senior managers within trauma networks.

Ensure that each healthcare professional within the trauma service has the training and skills to deliver, safely and effectively, the interventions they are required to give, in line with this guideline and the NGC summaries of the NICE guidelines Fractures (complex): assessment and management, Major trauma: assessment and initial management, and Spinal injury: assessment and initial management.

Enable each healthcare professional who delivers care to people with fractures to have up-to-date training in the interventions they are required to give.

Definitions

Strength of Recommendations

Some recommendations can be made with more certainty than others. The Guideline Committee makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the Guideline Committee is confident that, given the information it has looked at, most patients would choose the intervention. The

wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

Interventions That Must (or Must Not) Be Used

The Guideline Committee usually uses 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally the Guideline Committee uses 'must' (or 'must not') if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions That Should (or Should Not) Be Used – a 'Strong' Recommendation

The Guideline Committee uses 'offer' (and similar words such as 'refer' or 'advise') when confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. The Guideline Committee uses similar forms of words (for example, 'Do not offer…') when confident that an intervention will not be of benefit for most patients.

Interventions That Could Be Used

The Guideline Committee uses 'consider' when confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Clinical Algorithm(s)

A National Institute for Health and Care Excellence (NICE) pathway titled "Trauma overview" is provided on the NICE Web site .

Scope

Disease/Condition(s)

Non-complex fractures

Guideline Category

Diagnosis

Evaluation

Management

Treatment

Clinical Specialty

Emergency Medicine

Internal Medicine

Orthopedic Surgery

Pediatrics

Radiology

Intended Users

Advanced Practice Nurses

Emergency Medical Technicians/Paramedics

Health Care Providers

Hospitals

Nurses

Patients

Physician Assistants

Physicians

Guideline Objective(s)

To provide recommendations on the diagnosis, management and follow-up of non-complex fractures

Target Population

Adults, young people and children who present with a suspected non-complex fracture

Note: The following groups are not covered by the guideline: any person with a complex fracture including skull fracture, hip fracture, spinal injury, or open fracture.

Interventions and Practices Considered

1. Initial pain management and immobilisation
    - Pain assessment
    - Initial pharmacological management of pain in adults (16 or over) (oral paracetamol, oral paracetamol plus codeine, intravenous paracetamol supplemented with intravenous morphine, supplemental non-steroidal anti-inflammatory drugs [NSAIDs], avoiding NSAIDs in frail or older adults)
    - Initial pharmacological management of pain in children (under 16s) (oral ibuprofen, oral paracetamol, both for mild to moderate pain; intranasal or intravenous opioids for moderate to severe pain)
    - Delivery of a definitive written report of emergency department X-rays of suspected fractures before discharge
    - Splinting long bone fractures of the leg in the pre-hospital setting
    - Femoral nerve blocks in children (under 16s)
2. Acute stage assessment and diagnostic imaging
    - Use of clinical prediction rules (Ottawa knee rules) for suspected knee fractures
    - Use of clinical prediction rules (Ottawa ankle and foot rules) for suspected ankle fractures
    - Magnetic resonance imaging (MRI) of suspected scaphoid fractures followed by clinical exam
3. Management in the emergency department
    - Reduction of distal radius fractures (use of intravenous regional anaesthesia [Bier's block], avoiding gas and air [nitrous oxide and oxygen] on its own)
    - Management of torus fractures (avoiding rigid cast for torus fractures of the distal radius)
4. Ongoing orthopaedic management
    - Non-surgical orthopaedic management of unimalleolar ankle fractures

    - Timing of surgery for ankle fractures
    - Timing of surgery for distal radius fractures
    - Definitive treatment of distal radius fractures in adults (skeletally mature) (manipulation and a plaster cast, K-wire fixation, open reduction and internal fixation)
5. Definitive treatment of distal radius fractures in children (skeletally immature) (below-elbow plaster cast, K-wire fixation)
6. Definitive treatment of proximal humerus fractures in adults (skeletally mature) (non-surgical or surgical management)
7. Definitive treatment of femoral shaft fractures in children according to age and weight (skeletally immature) (simple padded splint, Pavlik's harness, Gallows traction, straight leg skin traction with possible conversion to hip spica cast, elastic intramedullary nails, elastic intramedullary nails supplemented by end-caps, lateral-entry antegrade rigid intramedullary nail, submuscular plating, mobilisation after surgery in people with distal femoral fractures)
8. Documentation
    - Developing and using standard documentation
    - Ensuring documentation of handover
    - Ensuring all documentation goes with patients at transfer
    - Producing a written summary giving diagnosis, management plan and expected outcomes
9. Information and support for patients, family members and carers
    - Providing support to patients, family member and carers
    - Providing support for children and vulnerable adults
    - Providing patients, family members, and carers verbal and written information about their injuries, including images and their management plan
    - Documentation all key information
    - Providing information about transfer from the emergency department
10. Addressing issues of non-accidental injury before discharge in all children with femoral fractures
11. Training and skills
    - Ensuring that healthcare professionals within the trauma service have the training and skills to deliver, safely and effectively, the required interventions
    - Enabling healthcare professionals who care for people with fractures to have up-to-date training in the required interventions

Major Outcomes Considered

- Adverse effects associated with assessment and management
- Functional scales that quantify level of disability
- Health-related quality of life
- Return to normal activities
- Healthcare contacts: duration and continuity
- Morbidity
- Mortality
- Patient-reported outcomes
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and related appendices.

Developing the Review Questions and Outcomes

Review questions were developed in a PICO framework (patient, intervention, comparison and outcome) for intervention reviews. Review questions were developed with a framework of population, prognostic factor and outcomes for prognostic reviews, and with a framework of population, index tests, reference standard and target condition for reviews of diagnostic test accuracy. This was to guide the literature searching process, critical appraisal and synthesis of evidence, and to facilitate the development of recommendations by the Guideline Development Group (GDG). They were drafted by the NCGC technical team and refined and validated by the GDG. The questions were based on the key clinical areas identified in the scope (Appendix A).

A total of 27 review questions were identified.

Full literature searches, critical appraisals and evidence reviews were completed for all the specified review questions.

Searching for Evidence

Clinical Literature Search

The aim of the literature search was to systematically identify all published clinical evidence relevant to the review questions. Searches were undertaken according to the parameters stipulated within the NICE Guidelines Manual (2012) (see the "Availability of Companion Documents" field). Databases were searched using medical subject headings and free-text terms. Foreign language studies were not reviewed and, where possible, searches were restricted to articles published in the English language. All searches were conducted in MEDLINE, EMBASE, and the Cochrane Library, and were updated for the final time on either 8th or 9th April 2015. No papers added to the databases after this date were considered.

Search strategies were quality assured by cross-checking reference lists of highly relevant papers, analysing search strategies in other systematic reviews, and asking GDG members to highlight any additional studies. The questions, the study types applied, the databases searched and the years covered can be found in Appendix F.

The titles and abstracts of records retrieved by the searches were sifted for relevance, with potentially significant publications obtained in full text. These were then assessed against the inclusion criteria.

Health Economic Literature Search

Systematic searches were undertaken to identify relevant health economic evidence within the published literature. The National Health Service Economic Evaluation Database (NHS EED), the Health Economic Evaluations Database (HEED) and Health Technology Assessment (HTA) database were searched using broad population terms and no date restrictions. A search was also run in MEDLINE and EMBASE using a specific economic filter with population terms. Where possible, searches were restricted to articles published in the English language. Economics search strategies are included in Appendix F. All searches were updated for the final time on either 8th or 9th April 2015 except in HEED which ceased production in 2014. No papers added to the databases after this date were considered.

Evidence Gathering and Analysis

The tasks of the research fellow are listed below and described in further detail in the full version of the

guideline. The research fellow:

- Identified potentially relevant studies for each review question from the relevant search results by reviewing titles and abstracts, and deciding which should be ordered as full papers. Full papers were then obtained.
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify studies that addressed the review question in the appropriate population, and reported on outcomes of interest (see Appendix C for review protocols)

Inclusion and Exclusion Criteria

The inclusion and exclusion of studies was based on the criteria defined in the review protocols (see Appendix C). Excluded studies by review question (with the reasons for their exclusion) are listed in Appendix K. The GDG was consulted about any uncertainty regarding inclusion or exclusion.

The key population inclusion criterion was:

- People of all ages experiencing a fracture as a result of a traumatic physical event

The key population exclusion criterion was:

- People with an open, pelvic or pilon fracture

Conference abstracts were not automatically excluded from any review, but no relevant conference abstracts were identified for this guideline. Literature reviews, posters, letters, editorials, comment articles, unpublished studies and studies not in English were excluded.

Type of Studies

Randomised trials, non-randomised trials, and observational studies (including diagnostic or prognostic studies) were included in the evidence reviews as appropriate.

For most intervention reviews in this guideline, parallel randomised controlled trials (RCTs) were included because they are considered the most robust type of study design that could produce an unbiased estimate of the intervention effects. Crossover RCTs were not appropriate for any questions.

If non-randomised studies were appropriate for inclusion in intervention reviews (that is, non-drug trials with no randomised evidence) the GDG identified a priori in the protocol the variables which must either be equivalent at baseline or that the analysis had to adjust for any baseline differences. If the study did not fulfil either criterion it was excluded. Please refer to Appendix C for full details on the study design of studies selected for each review question. Where data from observational studies were included meta-analysis was conducted provided the studies had comparable populations, interventions and comparators. Because observational studies had to consider all key confounding variables, it was assumed that there were no important differences between studies in terms of the extent that confounding had occurred, and meta-analysis was therefore regarded as acceptable in this context.

For diagnostic reviews, diagnostic RCTs, cross-sectional and retrospective studies were included. For prognostic reviews, prospective and retrospective cohort studies were included. Case–control studies were not included.

Contacting Authors

If a study had inadequate information to permit a full evaluation of risk of bias, or had insufficient details on the outcomes, then the GDG had the option to request more information from the study's authors.

This only occurred once in the guideline. For the proximal humerus review, further data was requested and received from Professor A. Rangan, who is involved in the ProFHER trial.

Evidence of Cost-effectiveness

Evidence on cost-effectiveness related to the key clinical issues being addressed in the guideline was

sought. The health economist:

- Undertook a systematic review of the economic literature
- Undertook new cost-effectiveness analysis in priority areas

Literature Review

The health economist:

- Identified potentially relevant studies for each review question from the economic search results by reviewing titles and abstracts – full papers were then obtained
- Reviewed full papers against pre-specified inclusion/exclusion criteria to identify relevant studies (see below for details)

Inclusion and Exclusion

Full economic evaluations (studies comparing costs and health consequences of alternative courses of action: cost–utility, cost-effectiveness, cost-benefit and cost-consequence analyses) and comparative costing studies that addressed the review question in the relevant population were considered potentially applicable as economic evidence.

Studies that only reported cost per hospital (not per patient) or only reported average cost effectiveness without disaggregated costs and effects were excluded. Abstracts, posters, reviews, letters and editorials, foreign language publications and unpublished studies were excluded. Studies judged to have an applicability rating of 'not applicable' were excluded (this included studies that took the perspective of a non-Organisation for Economic Co-operation and Development [OECD] country).

Remaining studies were prioritised for inclusion based on their relative applicability to the development of this guideline and the study limitations. For example, if a high quality, directly applicable UK analysis was available other less relevant studies may not have been included. Where exclusions occurred on this basis, this is noted in the relevant section.

For more details about the assessment of applicability and methodological quality see the economic evaluation checklist (The Guidelines Manual 2012, Appendix H) and the health economics research protocol in Appendix C.

When no relevant economic analysis was found from the economic literature review, relevant UK NHS unit costs related to the compared interventions were presented to the GDG to inform the possible economic implication of the recommendation being made.

Number of Source Documents

See Appendix D: Clinical Article Selection and Appendix E: Economic Article Selection (see the "Availability of Companion Documents" field) for detailed flow charts on the article selection process, including total number of records identified through database searching, records screened, records excluded, full-text articles assessed for eligibility, studies included in review, and studies excluded from review.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grading of Recommendations Assessment, Development and Evaluation (GRADE)

Level	Description
High	Further research is very unlikely to change confidence in the estimate of effect.
Moderate	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
Low	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
Very Low	Any estimate of effect is very uncertain.

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and related appendices.

Evidence Gathering and Analysis

The tasks of the research fellow are listed below and described in further detail in the full version of the guideline. The research fellow:

- Critically appraised relevant studies using the appropriate study design checklists as specified in The Guidelines Manual (NICE [2012] [see the "Availability of Companion Documents" field]).
- Critically appraised relevant studies with a prognostic or qualitative study design NCGC checklist.
- Extracted key information about interventional study methods and results using Evibase, NCGC purpose-built software. Evibase produces summary evidence tables, with critical appraisal ratings.
- Key information about non-interventional study methods and results were manually extracted onto standard evidence tables and critically appraised separately (see Appendix G for the evidence tables).
- Generated summaries of the evidence by outcome. Outcome data is combined, analysed and reported according to study design:
  - Randomised data is meta-analysed where appropriate and reported in Grading of Recommendations Assessment, Development and Evaluation (GRADE) profiles.
  - Observational data presented as a range of values in GRADE profiles.
  - Diagnostic data is meta-analysed if appropriate or presented as a range of values in adapted GRADE profiles.
  - Prognostic data is meta-analysed where appropriate and reported in GRADE profiles.
  - Qualitative data is summarised across studies where appropriate and reported in themes.

A sample of a minimum of 20% of the abstract lists of the first three review questions by new reviewers were double sifted by a senior research fellow. As no papers were missed by any reviewers, no further double sifting was carried out. All of the evidence reviews were quality assured by a senior research fellow. This included checking:

- Papers were included or excluded appropriately
- A sample of the data extractions
- Correct methods were used to synthesis data
- A sample of the risk of bias assessments

Methods of Combining Evidence

Data Synthesis for Intervention Reviews

Where possible, meta-analyses were conducted to combine the data from the studies for each of the outcomes in the review question using RevMan5 software.

All analyses were stratified for skeletal maturity or age (under 18 years and 18 years or over), which meant that different studies with predominant groups (whether skeletal maturity or age) in different strata were not combined and analysed together. For some questions additional stratification was used, and this is documented in the individual question protocols (see Appendix C). If additional strata were used this led to sub-strata (for example, 2 stratification criteria would lead to 4 sub-strata categories, or 3 stratification criteria would lead to 8 sub-strata categories) which would be analysed separately.

Age was defined as the stratification group in the protocols. However, it was decided after reviews were started that skeletal maturity was seen as a more clinically relevant strata. Skeletal maturity leads to different recovery trajectories and informs different forms of management. It can occur at various ages and can vary between bones. However, often papers did not specify the skeletal maturity of the sample. Consequently, analyses were split by skeletal maturity where possible, and by an age a proxy where this wasn't reported.

Analysis of Different Types of Data

See Section 4.3.4.1 of the full version of the guideline for details regarding analysis of different types of data including dichotomous outcomes, continuous outcomes, generic inverse variance, heterogeneity, and complex analysis/further analysis.

Data Synthesis for Diagnostic Test Accuracy Reviews

Two separate review protocols were produced to reflect the two different diagnostic study designs:

Diagnostic Randomised Controlled Trials (RCTs)

Diagnostic RCTs (sometimes referred to as test and treat trials) are a randomised comparison of two diagnostic tests, with study outcomes being clinically important consequences of diagnostic accuracy (patient outcomes similar to those in intervention trials, such as mortality). Patients are randomised to receive test A or test B, followed by identical therapeutic interventions based on the results of the test (that is, someone with a positive result would receive the same treatment regardless of whether they were diagnosed by test A or test B). Downstream patient outcomes are then compared between the two groups. As treatment is the same in both arms of the trial, any differences in patient outcomes will reflect the accuracy of the tests in correctly establishing who does and does not have the condition. Diagnostic RCTs were searched for first in preference to diagnostic accuracy studies (see below). Data were synthesised using the same methods for intervention reviews (see Section 4.3.4.1 of the full version of the guideline).

Diagnostic Accuracy Studies

For diagnostic test accuracy studies, a positive result on the index test was found in two different ways, according to whether the index test was measured on a continuous scale or was bivariate.

For continuous index test measures, a positive result on the index test was found if the patient had values of the chosen measured quantity above or below a threshold value, and different thresholds could be used. The threshold of a diagnostic test is defined as the value at which the test can best differentiate between those with and without the target condition and, in practice, it varies amongst studies. Diagnostic test accuracy measures used in the analysis were sensitivity and specificity, and, if different diagnostic thresholds were used within a single study, area under the receiver operating characteristics (ROC) curve.

For bivariate index test measures a positive result on the index test was found if a particular clinical sign was detected. For example, a positive test would be recorded if a fracture was observed. Diagnostic test

accuracy measures used in the analysis were sensitivity and specificity.

Coupled forest plots of sensitivity and specificity with their 95% confidence intervals (CIs) across studies (at various thresholds) were produced for each test, using RevMan5. In order to do this, 2x2 tables (the number of true positives, false positives, true negatives and false negatives) were directly taken from the study if given, or else were derived from raw data or calculated from the set of test accuracy statistics.

Diagnostic meta-analysis was conducted where appropriate; that is, when 5 or more studies were available per threshold. Test accuracy for the studies was pooled using the bivariate method modelled in Winbugs®. The bivariate method uses logistic regression on the true positives, true negatives, false positives and false negatives reported in the studies. Overall sensitivity and specificity and confidence regions were plotted (using methods outlined by Novielli et al.). For scores with less than five studies, median sensitivity and the paired specificity were reported where possible. If an even number of studies were reported the lowest value of the two middle pairs was reported.

Heterogeneity or inconsistency amongst studies was visually inspected in the forest plots.

Data Synthesis for Risk Prediction Rules

Evidence reviews on risk prediction rules/tools results were presented separately for discrimination and calibration. The discrimination data was analysed according to the principles outlined under the section on data synthesis for diagnostic accuracy studies. Calibration data such as R^2, if reported, were presented separately to the discrimination data. The results were presented for each study separately along with the quality rating for the study. Inconsistency and imprecision were not assessed.

Data Synthesis for Qualitative Reviews

For each included paper sub-themes were identified and linked to a generic theme. An example of a sub-theme identified by patients and carers is 'keeping an open channel of communication about reasons for any delays in the emergency room' and this is linked to a broader generic theme of 'information'. In some cases, sub-themes would relate to more than one generic theme. A summary evidence table of generic themes and underpinning sub-themes was then produced alongside the quality of the evidence.

Appraising the Quality of Evidence by Outcomes

Interventional Studies

The evidence for outcomes from the included RCT and observational studies were evaluated and presented using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group . The software (GRADEpro) developed by the GRADE working group was used to assess the quality of each outcome, taking into account individual study quality and the meta-analysis results.

Each outcome was first examined for each of the quality elements listed and defined in Table 2 in the full version of the guideline.

Details of how the four main quality elements (risk of bias, indirectness, inconsistency and imprecision) were appraised for each outcome are provided in Section 4.3.5.1 the full version of the guideline. Publication or other bias was only taken into consideration in the quality assessment if it was apparent.

Overall Grading of the Quality of Clinical Evidence

Once an outcome had been appraised for the main quality elements, an overall quality grade was calculated for that outcome. The scores from each of the main quality elements (0, −1 or −2) were summed to give a score that could be anything from 0 (the best possible) to −8 (the worst possible). However, scores were capped at −3. This final score was then applied to the starting grade that had originally been applied to the outcome by default, based on study design. For example, all RCTs started as High and the overall quality became Moderate, Low or Very low if the overall score was −1, −2 or −3

points respectively. The significance of these overall ratings is explained in the "Rating Scheme for the Strength of the Evidence" field. The reasons or criteria used for downgrading were specified in the footnotes of the GRADE tables.

On the other hand, observational interventional studies started at Low, and so a score of −1 would be enough to take the grade to the lowest level of Very low. Observational studies could, however, be upgraded if there was: a large magnitude of effect, a dose-response gradient, and if all plausible confounding would reduce a demonstrated effect.

See Sections 4.3.5.2 to 4.3.5.4 and Tables 5 and 6 in the full version of the guideline for additional details on grading of quality of evidence for prognostic and diagnostic studies and for qualitative reviews.

Assessing Clinical Importance

The GDG assessed the evidence by outcome in order to determine if there was, or potentially was, a clinically important benefit, a clinically important harm or no clinically important difference between interventions. To facilitate this, binary outcomes were converted into absolute risk differences (ARDs) using GRADEpro software: the median control group risk across studies was used to calculate the ARD and its 95% CI from the pooled risk ratio.

The assessment of clinical benefit, harm, or no benefit or harm was based on the point estimate of absolute effect for intervention studies which was standardised across the reviews. The GDG considered for most of the outcomes in the intervention reviews that if at least 100 participants per 1000 (10%) achieved (if positive) the outcome of interest in the intervention group compared with the comparison group then this intervention would be considered beneficial. The same point estimate but in the opposite direction would apply if the outcome was negative. For the critical outcomes of mortality any reduction represented a clinical benefit. For adverse events 50 events or more represented clinical harm. For continuous outcomes if the mean difference was greater than the minimally important difference then this presented a clinical benefit or harm. For outcomes such as mortality any reduction or increase was considered to be clinically important.

This assessment was carried out by the GDG for each critical outcome, and an evidence summary table was produced to compile the GDG's assessments of clinical importance per outcome, alongside the evidence quality and the uncertainty in the effect estimate (imprecision).

Clinical Evidence Statements

Clinical evidence statements are summary statements that are presented after the GRADE profiles, summarising the key features of the clinical effectiveness evidence presented. The wording of the evidence statements reflects the certainty/uncertainty in the estimate of effect. The evidence statements were presented by outcome and encompassed the following key features of the evidence:

- The number of studies and the number of participants for a particular outcome
- An indication of the direction of clinical importance (if one treatment is beneficial or harmful compared to the other or whether there is no difference between the two tested treatments)
- A description of the overall quality of evidence (GRADE overall quality)

Evidence of Cost-effectiveness

Evidence on cost-effectiveness related to the key clinical issues being addressed in the guideline was sought. The health economist:

- Undertook a systematic review of the economic literature
- Undertook new cost-effectiveness analysis in priority areas

Literature Review

The health economist:

- Critically appraised relevant studies using the economic evaluations checklist as specified in The

Guidelines Manual 2012
Extracted key information about the study's methods and results into evidence tables (see Appendix H. Studies considered eligible but were excluded can be found in Appendix L)
Generated summaries of the evidence in NICE economic evidence profiles (included in the relevant chapter write-ups) – see below for details.

NICE Economic Evidence Profiles

The NICE economic evidence profile has been used to summarise cost and cost-effectiveness estimates. The economic evidence profile shows, for each economic study, an assessment of applicability and methodological quality, with footnotes indicating the reasons for the assessment. These assessments were made by the health economist using the economic evaluation checklist from The Guidelines Manual 2012, Appendix H. It also shows incremental costs, incremental outcomes (for example, quality-adjusted life years [QALYs]) and the incremental cost-effectiveness ratio from the primary analysis, as well as information about the assessment of uncertainty in the analysis. See Table 7 for more details.

If a non-UK study was included in the profile, the results were converted into pounds sterling using the appropriate purchasing power parity .

Undertaking New Health Economic Analysis

As well as reviewing the published economic literature for each review question, as described above, new economic analysis was undertaken by the health economist in priority areas. Priority areas for new health economic analysis were agreed by the GDG after formation of the review questions and consideration of the available health economic evidence. Additional data for the analysis was identified as required through additional literature searches undertaken by the health economist, and discussion with the GDG. Model structure, inputs and assumptions were explained to and agreed by the GDG members during meetings, and they commented on subsequent revisions.

See Appendix M for details of the health economic analysis/analyses undertaken for the guideline.

Cost-effectiveness Criteria

NICE's report 'Social value judgements: principles for the development of NICE guidance' sets out the principles that GDGs should consider when judging whether an intervention offers good value for money.

In general, an intervention was considered to be cost effective if either of the following criteria applied (given that the estimate was considered plausible):

The intervention dominated other relevant strategies (that is, it was both less costly in terms of resource use and more clinically effective compared with all the other relevant alternative strategies), or
The intervention cost less than £20,000 per QALY gained compared with the next best strategy

If the GDG recommended an intervention that was estimated to cost more than £20,000 per QALY gained, or did not recommend one that was estimated to cost less than £20,000 per QALY gained, the reasons for this decision are discussed explicitly in the 'from evidence to recommendations' section of the relevant chapter with reference to issues regarding the plausibility of the estimate or to the factors set out in the 'Social value judgements: principles for the development of NICE guidance'.

In the Absence of Economic Evidence

When no relevant published studies were found, and a new analysis was not prioritised, the GDG made a qualitative judgement about cost effectiveness by considering expected differences in resource use between options and relevant UK National Health Service (NHS) unit costs, alongside the results of the clinical review of effectiveness evidence.

The UK NHS costs reported in the guideline are those that were presented to the GDG and were correct at the time recommendations were drafted. They may have changed subsequently before the time of

publication.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and related appendices.

Who Developed the Trauma Guidelines?

The four clinical guidelines and service delivery guidance consist of related topics with overlap in populations and key clinical areas for review. The guidelines have been developed together to avoid overlap and ensure consistency. This required careful planning to ensure the Guideline Development Groups (GDGs) had the support they needed. Senior clinical expertise was recruited in addition to the standard GDG.

Project Executive Team

The overlap in the content of the four clinical guidelines and the service delivery guidance required an approach that ensured coherence and avoided duplication across the guidelines. To address this, clinical experts from across the guidelines were recruited to form an umbrella group, the Project Executive Team (PET). The PET met quarterly throughout the development of the guidelines. At the PET meetings, the members provided expert advice to the technical team and GDGs on the crossover of reviews across guidelines.

Guideline Development Group Expert Members

Expert members were healthcare professionals who worked across the four clinical guidelines and the service delivery guidance, and attended the GDGs that were relevant to their expertise. The expert members provided an additional level of coherence across the guidelines, helping to identify potential duplication in the areas of their expertise (see the list of the GDG expert members).

Guideline Development Group (GDG)

Each guideline 'stands alone' and addresses a specific area of care. A dedicated, multidisciplinary GDG, comprising health professionals, researchers and lay members developed this guidance.

The GDG was convened by the NCGC in accordance with guidance from NICE. The GDG met for two days every 6 weeks during the development of the guideline.

Staff from the NCGC provided methodological support and guidance for the development process. The technical team working on the guideline included a project manager, systematic reviewers, health economists and information scientists. The team undertook systematic searches of the literature, appraised the evidence, conducted meta-analysis and cost-effectiveness analysis where appropriate, and drafted the guideline in collaboration with the GDG.

Developing Recommendations

Over the course of the guideline development process, the GDG was presented with:

- Evidence tables of the clinical and economic evidence reviewed from the literature. All evidence tables are in Appendix G.
- Summary of clinical and economic evidence and quality as presented in Chapters 6-13 of the full

version of the guideline.
Forest plots and summary receiver operating characteristics (ROC) curves (see Appendix J)
A description of the methods and results of the cost-effectiveness analysis undertaken for the guideline (see Appendix M)

Recommendations were drafted on the basis of the GDG interpretation of the available evidence, taking into account the balance of benefits, harms and costs. When clinical and economic evidence was of poor quality, conflicting or absent, the GDG drafted recommendations based on their expert opinion. The considerations for making consensus-based recommendations include the balance between potential harms and benefits, economic or implications compared with the benefits, current practices, recommendations made in other relevant guidelines, patient preferences and equality issues. The consensus recommendations were done through discussions in the GDG. The GDG also considered whether the uncertainty was sufficient to justify delaying making a recommendation to await further research, taking into account the potential harm of failing to make a clear recommendation.

The main considerations specific to each recommendation are outlined in the Evidence to Recommendation Section preceding the recommendation section in the full version of the guideline.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendations

Some recommendations can be made with more certainty than others. The Guideline Committee makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the Guideline Committee is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

Interventions That Must (or Must Not) Be Used

The Guideline Committee usually uses 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally the Guideline Committee uses 'must' (or 'must not') if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions That Should (or Should Not) Be Used – a 'Strong' Recommendation

The Guideline Committee uses 'offer' (and similar words such as 'refer' or 'advise') when confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. The Guideline Committee uses similar forms of words (for example, 'Do not offer…') when confident that an intervention will not be of benefit for most patients.

Interventions That Could Be Used

The Guideline Committee uses 'consider' when confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Cost Analysis

Economic evidence is provided for each review question in the full version of the guideline (see the "Availability of Companion Documents" field).

See also the "Availability of Companion Documents" field for Appendix M: Cost-effectiveness Analysis: Imaging of Suspected Scaphoid Fractures (see description and conclusions below).

Cost-effectiveness Analysis: Imaging of Suspected Scaphoid Fractures

Published economic evidence in evaluating trade-offs is limited. The evidence found in the economic literature search assessed magnetic resonance imaging (MRI) after an indeterminate X-ray compared to follow-up X-rays and did not consider any health effects. One study also looked at computed tomography (CT) scans but also did not include any health effects and the reference standard used to inform the diagnostic accuracy data was delayed X-rays and not MRI as stated in the guideline's protocol.

This question was prioritised for original economic analysis due to the lack of applicable economic evidence of sufficient quality for all strategies in this question. The outcome of the question could have a large economic impact on current practice due to the difference in cost of the imaging modalities, as well as the high incidence of suspected scaphoid fractures but low prevalence of true fractures. A cost-utility analysis on the optimal imaging strategy for patients with a suspected scaphoid fracture is presented in Appendix M.

Approach to Modelling

The model was developed using Microsoft Excel 2010. It assesses the impact of the different diagnostic accuracies of each imaging modality on both healthcare costs and health effects (quality-adjusted life years [QALYs]). It looks at treatments following correct diagnoses and incorrect diagnoses, for patients who have fractures and for those who do not. Health effects were incorporated into the model by means of a long term reduction in quality of life due to delayed treatment following an incorrect diagnosis of a fracture.

Conclusions

Immediate MRI is likely to be the most cost-effective imaging strategy for patients with a suspected scaphoid fracture.

An initial X-ray may be cost effective if there are likely to be fractures that are missed on MRI but captured on X-ray. If this is the case, a screening X-ray followed by MRI in the same attendance may be cost effective as the additional cost of an attendance would not be required.

Immediate CT may be cost effective if the effects of missing a scaphoid fracture either last no longer than four years or only occur in a small proportion of patients with missed fractures. This may also be optimal if the sensitivity of CT is greater than the evidence suggests.

This analysis is assessed as directly applicable with potentially serious limitations.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Validation Process

The guidance is subject to an eight week public consultation and feedback as part of the quality assurance and peer review the document. All comments received from registered stakeholders are responded to in turn and posted on the National Institute for Health and Care Excellence (NICE) Web site when the pre-publication check of the full guideline occurs.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

Refer to the "Type of Studies" section in the "Description of Methods Used to Collect/Select the Evidence" field for a description of the studies that support the recommendations.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Optimal assessment and management of trauma patients with non-complex fracture
- By increasing uniformity of care both mortality and morbidity will fall further.
- Improved practice so that people with fractures receive the care that they need without unnecessary tests and treatments

See the "Trade-off between clinical benefits and harms" sections in the full version of the guideline (see the "Availability of Companion Documents" field) for benefits of specific interventions.

Potential Harms

- The Guideline Development Group (GDG) emphasised that particular care should be taken during administration of intravenous (IV) morphine to frail or older adults, who are at increased risk of side effects following administration.
- The group also discussed the benefits and harms of non-steroidal anti-inflammatory drug (NSAID) administration in adults. In particular, two aspects were discussed: 1) the use of NSAIDS in frail or older adults where they may pose a risk of life-threatening gastrointestinal bleeding and significant adverse effects on renal function; and 2) the potential negative effect of NSAIDs on bone healing.
- There were no reported instances of death, major cardiac event or arrhythmia with regional anaesthesia. Rates of operations cancelled due to tourniquet related technical problems and asymptomatic cuff failure were 0.8% and 0.2%, respectively. Convulsions/seizure were reported in one patient for an overall rate of 0.08%. This patient was known to have epilepsy. These adverse events do not appear to outweigh the clinical benefits of IV regional intubation.
- If full weight bearing is performed early, most patients are expected to benefit. However, there is an increased risk of the fixation failing and the patient requiring further surgery, so there is a trade-off between the reduced costs of hospital stay and the increased costs from further surgery. There is also the same trade-off between improved outcomes of those who benefit and the reduced outcomes of those who require further surgery.

See the "Trade-off between clinical benefits and harms" sections in the full version of the guideline (see the "Availability of Companion Documents" field) for additional discussion of harms of specific interventions.

Contraindications

Contraindications

The Medicines and Healthcare Products Regulatory Agency (MHRA) have restricted use in codeine to those over the age of 12 years of age. Furthermore, it is contraindicated in a number of other groups between the ages of 12 and 18 years.

Qualifying Statements

Qualifying Statements

- The recommendations in this guideline represent the view of National Institute for Health and Care Excellence (NICE), arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The application of the recommendations in this guideline is not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.
- Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Clinical Algorithm

Foreign Language Translations

Mobile Device Resources

Patient Resources

Resources

Slide Presentation

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Timeliness

Identifying Information and Availability

Bibliographic Source(s)

National Clinical Guideline Centre. Fractures (non-complex): assessment and management. London (UK): National Institute for Health and Care Excellence (NICE); 2016 Feb 17. 17 p. (NICE guideline; no. 38).

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2016 Feb 17

Guideline Developer(s)

National Guideline Centre - National Government Agency [Non-U.S.]

Source(s) of Funding

The National Clinical Guideline Centre (NCGC) was commissioned by the National Institute for Health and Care Excellence (NICE) to undertake the work on this guideline.

Guideline Committee

Guideline Development Group (GDG)

Composition of Group That Authored the Guideline

Guideline Development Group (GDG) Members: Matthew Costa, Professor Orthopaedic Trauma, University of Oxford; Bob Handley (*Co-chair*), Consultant Trauma and Orthopaedic Surgeon, Trauma Service, John Radcliffe Hospital, Oxford; Gillian Hayter, Patient member; Philip Henman, Consultant Orthopaedic Surgeon, The Newcastle upon Tyne Hospitals NHS Foundation Trust; Elizabeth Houghton, Patient member; Fiona Lecky, Emergency Medicine Research, University of Sheffield; Iain McFadyen (*Co-chair*), Consultant Trauma and Orthopaedic Surgeon, Royal Stoke University Hospital, University of North Midlands NHS Trust; Jagdeep Nanchahal, Professor of Hand, Plastic and Reconstructive Surgery, Kennedy Institute of Rheumatology, University of Oxford, Oxford University Hospitals; Lucy Silvester, Therapy Consultant for Major Trauma and Orthopaedics, St George's University Hospitals NHS Foundation Trust; David Skinner, Emeritus Consultant in Emergency Medicine, Oxford; Aidan Slowie, Lead Nurse Major Trauma, St George's University Hospitals NHS Foundation Trust; Paul Wallman, Consultant in Emergency Medicine, Brighton and Sussex University Hospitals

Financial Disclosures/Conflicts of Interest

At the start of the guideline development process all Guideline Development Group (GDG) members declared interests including consultancies, fee-paid work, share-holdings, fellowships and support from the healthcare industry. At all subsequent GDG meetings, members declared new and arising conflicts of interest.

Members were either required to withdraw completely, or for part of the discussion, if their declared interest made it appropriate. The details of declared interests and the actions taken are shown in Appendix B (see the "Availability of Companion Documents" field).

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the National Institute for Health and Care Excellence (NICE) Web site . Also available for download in ePub or eBook formats from the NICE Web site .

Availability of Companion Documents

The following are available:

Fractures (non-complex): assessment and management. Full guideline. London (UK): National Institute for Health and Care Excellence; 2016 Feb. 295 p. (NICE guideline; no. 38). Available from the National Institute for Health and Care Excellence (NICE) Web site .

Fractures (non-complex): assessment and management. Appendices. London (UK): National Institute for Health and Care Excellence; 2016 Feb. (NICE guideline; no. 38). Available from the NICE Web site .

Fractures (non-complex): assessment and management. Costing report. London (UK): National Institute for Health and Care Excellence; 2016 Feb. 13 p. Available from the NICE Web site .

Fractures (non-complex): assessment and management. Baseline assessment tool. London (UK): National Institute for Health and Care Excellence; 2016 Feb. (NICE guideline; no. 38). Available from the NICE Web site .

Fractures (non-complex): assessment and management. Slide set. London (UK): National Institute for Health and Care Excellence; 2016 Mar. 92 p. (NICE guideline; no. 38). Available from the NICE Web site .

The guidelines manual 2012. London (UK): National Institute for Health and Care Excellence (NICE); 2012 Nov. Available from the NICE Web site .

Patient Resources

The following is available:

Fractures (non-complex): assessment and management. Information for the public. London (UK): National Institute for Health and Care Excellence; 2016 Feb. 9 p. (NICE guideline; no. 38). Available from the National Institute for Health and Care Excellence (NICE) Web site .

Also available for download in eBook and ePub formats from the NICE Web site

. Also available in Welsh from the NICE Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI Institute on May 31, 2016. This summary was updated by ECRI Institute on October 21, 2016 following the U.S. Food and Drug Administration advisory on opioid pain and cough medicines combined with benzodiazepines. This summary was updated by ECRI Institute on June 22, 2017 following the U.S. Food and Drug Administration advisory on Codeine and Tramadol Medicines.

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